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Creators: Nold, H. E. (Henry Ellsworth), 1883-1967

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THE CONSUMER'S COAL PROBLEM

By PROF. H. E. NOLD, *Department of Mine Engineering*

WE are living in an age of power. Our manufacturing, our transportation, systems and the comforts of our homes all depend in large measure on the production and utilization of power. Without power production on a large scale, our modern civilization would be impossible.

The principal means of producing power has been, is, and will continue to be, coal. We have nothing to take the place of coal. Our natural gas is rapidly being depleted and will soon be a thing of the past. Our crude oil reserves are limited and at the present rate of increase of production and consumption will soon be exhausted.

It is true that the world's coal resources are enormous and that more than one-half lie within the United States, but the supply is not inexhaustible. At the present rate of increase of consumption and waste, our coal will be exhausted in a few hundred years. With the elimination of a large part of the present waste, the practice of possible economies in the use of fuel and a probable reduction in the rate of power production, our coal reserves should last thousands instead of hundreds of years.

It is manifestly impossible to attempt an exhaustive discussion of the consumer's coal problem in the space allotted for this paper, and I am, therefore, going to confine my discussion largely to the problem of the domestic consumer. For the same reasons and also because the anthracite problem is quite different, I will consider only bituminous or "soft" coal.

Mr. Domestic Consumer of coal is painfully aware of an annual coal bill much higher than before the war and much higher than he thinks it should be. In order to understand this problem, it will be necessary to examine, in preparation, the conditions in the mining fields which make coal more expensive to produce now than formerly.

In addition to increased labor and material costs there are natural conditions which continually tend to make the mining of coal more expensive. That coal which could be obtained easily and cheaply was, naturally, mined first. In general, the thinner the seam of coal to be mined the more the expense of mining, and the deeper the coal is underground the greater the cost of extracting it. Not many years ago, in Ohio, a four-foot seam of coal was considered about the thinnest that could be mined economically unless mining conditions were unusually favorable or the coal was of quality better than the ordinary. At the present time, most of our territory containing thick seams of coal near the surface has been developed, and in some places largely exhausted. The mining of coal three feet or even less in thickness is now common, and seams much thinner than this must be mined in the future. The mining of the deeper lying and thinner seams is now a real problem.

The labor costs of producing bituminous coal is about seventy per cent of the total cost. The increase in cost of labor is shown by the following: In 1913, an underground mine laborer in Ohio received \$2.84 per day. He now receives \$7.50 per day, an increase of 164%. This represents the largest single item of increased cost in coal production. The cost of supplies and equipment have also increased largely and add to the cost of mining. All of these causes have been operating for some years to make the production of coal more expensive and will continue to do so in the future. It is, therefore, not to be expected that the cost of a ton of coal in our cellars will ever drop to the price of twenty years ago, even if the wage and salary scales should be reduced to the level of that period.

There are, however, other and more direct causes of the present high cost of coal which are at least in part susceptible of control. The coal mines do not, as a rule, operate steadily or regularly. For example, in Ohio in the years 1914 to 1920, inclusive, the coal mines averaged only 174 working days per year. Even in 1918, when the demand for coal was great for war needs, the mines in our state worked only 221 days, while in 1922 the figure is not much over 100 days. This irregular production is due to seasonal demand for coal due to climatic conditions, fluctuations in industrial activity, and inadequacy of transportation facilities in times of active demand. It is aggravated by fear of the coal miners' strikes, which have been occurring with alarming regularity each two years when the operators' contracts with the miners expire.

One of the effects of this irregularity of coal production has been an increase in the cost of producing coal. The idle time expense in a coal mine is great because many operations, such as pumping, ventilation, removing roof falls and replacing broken timbers, must be continued at all times if the mine is to be capable of operating when orders for coal are received. According to tables published by the United States Coal Commission, this idle time cost amounted to about twenty cents per ton of coal mined in Ohio in 1920. This irregularity has also caused a considerable fluctuation in the price of coal over the year and, in general, has acted to increase the cost of coal to the consumer.

The peak demands for coal at certain times and the attendant high-selling price of coal have encouraged the opening of thousands of mines, many of which can afford to produce coal only at such times of peak demand and high prices. This practice has continued until we now have a mine capacity and capital investment in the United States sufficient to produce 750,000,000 tons of soft coal when 550,000,000 tons are all the market normally needs. In other words, we have, and are paying for, an overproduction capacity of almost forty per cent.

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The short working year, averaging about 200 to 220 days for mine workers, has led to the employment and support of about 150,000 more men than would be necessary to produce the country's coal supply if they could work full time. These workers must receive a wage scale sufficient to enable them to live a year on the proceeds of about 200 days' work. If the miners could work full time, their wages could be reduced \$1.50 per day and yet insure them an annual wage of about \$300 more than they receive at present. This alone would save almost thirty-five cents per ton on the labor cost of producing coal.

Many people blame the high price of coal on profiteering, and it is true that there has been and probably always will be some profiteering in this as well as in any other business. The bituminous coal mining industry, however, is a competitive one. The reports of the United States Coal Commission show that in 1921 there were over 12,000 bituminous coal producers, operating almost 15,000 mines in the United States. There is no monopolistic control of bituminous coal prices at the mines. It is true that the price fluctuates during the year, but it fluctuates with the variations in supply and demand. When the market is not active, the price of coal drops, and when the demand is active, the railroads are unable to haul as much coal as the mines can produce and the consumers would buy. Consequently the supply does not equal the demand and the price is raised by buyers bidding against each other. In fact, competitive conditions and a slack market have so reduced the selling price of bituminous coal at the mines since last June, that many hundreds of mines have been forced to suspend operations altogether because the selling price was and still is less than the cost of production.

If the retail cost of coal does not always drop in proportion to the mine prices, it is because our system of distribution from the mines to the consumer is faulty and frequently allows several profits between the producer and consumer. The domestic consumer also often demands much expensive service in the way of coal deliveries in small amounts, sometimes not over one-half ton. The coal consumer himself is to blame for a large amount of the dissatisfaction and trouble in coal industry with the consequent high selling of coal. The irregular work in the mines, the seasonal demand for coal and the rapid rise in coal prices due to lack of transportation facilities and consequent coal shortages, threatened and actual, at various times are caused largely by the consumer. Entirely too many users of coal for heating purposes forget that their coal consumption fluctuates with the weather. They forget all about the winter's coal pile until the cool autumn breezes remind them that winter is near. Then Mr. Coal Consumer and most of his neighbors want coal delivered at once. In 1922 one retail coal company in Columbus, Ohio, sold four times as much coal to domestic consumers in October as in September, and as a result of similar conditions over a wide area, the wholesale price of coal advanced one dollar per ton, and this advance

was, of course, paid for by the consumer. If the consumer would store a considerable portion of his winter's supply during the summer months, he would aid the miners by furnishing steadier employment; aid the mine owner by making possible more days of work per year, thus reducing the cost of coal by cutting down idle time expense, which is high in the mine; aid the railroads by reducing the great demand on their equipment at certain times of the year, which makes it impossible for them to handle the volume of business offered, while at other times thousands of coal cars stand idle; and aid himself financially by paying less for his fuel.

Fire, due to spontaneous combustion, is a hazard of large pile storage, but is not a danger in storing the amount ordinarily placed in our cellars. In spite of public opinion to the contrary, there is no appreciable deterioration in the quality of coal even when stored for periods of more than a year.

Mr. Domestic Consumer also materially increases his fuel bill by buying lump coal instead of mine run. The preparation of lump coal leaves a large amount of slack and nut coal, which the mine operator can sell only at a considerably reduced price, consequently the lump coal must be sold at a price high enough to cover the shrinkage in value of the coal removed when preparing it. With little more trouble, mine run coal can be burned in the average furnace. An examination of the spot mine prices of coal shows that during the last four months lump coals of the West Virginia splint and Hocking Valley varieties have been selling generally at the mines for from ninety cents to \$1.30 higher than mine run coal of the same varieties. During this same period lump coals of the smokeless or Pocahontas varieties are quoted at nearly \$3.00 more than mine run coals from the same mines.

Less coal would be needed in most homes if more of the heat were made available for heating the living rooms and less to heat the basement. A one-half inch covering of asbestos insulation on furnaces and hot air pipes would practically eliminate this waste of heat.

The average domestic consumer can also reduce his fuel bill by more care in the use of his coal. The following is quoted from a recent publication entitled "Fuel Manual for the Home," published under the auspices of the Smithsonian Institute:

"Test show that ashes frequently contain 50% of carbon. This is because the grates do not receive proper attention. In shaking grates, stop when the fire glow from above appears and before the live coals go into the ash pit."

In conclusion, the domestic consumer can aid the coal miner and operator and reduce his own coal bill:

By buying his winter's supply of coal during the summer months.

By using mine run coal instead of lump coal in his furnace.

By firing more carefully.

By covering furnace and pipes with an insulating covering.



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